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ANNUAL REPORT

DIVISION OF WATER RESOURCES

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

for the

FISCAL YEAR ENDING - June 30, 1985

Annual report
to the Mass. Water Resources Commission

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INTRODUCTION

Chapter 21, Sections 8 and 9 of the General Laws of the Commonwealth, enacted in 1956, established the existence, the duties and the jurisdiction of the Division of Water Resources under the Water Resources Commission. Chapter 706 of the Acts of 1975 placed the Division within and under the jurisdiction of the Department of Environmental Management as well as the Water Resources Commission. Chapter 589 of 1983, completely revised Chapter 21, Sections 8 through 16 placing the Division exclusively under the supervision and control of the Commissioner of the Department and transferred most of the duties formerly assigned to the Water Resources Commission to the Division of Water Resources.

Division's New Water Resources Planning Responsibilities

The sections of the Coastal Zone Management Act reorganizing the Water Resources Commission and the Interbasin Transfer Act gave the Water Resources Commission a number of important duties to include coordinating EOEA's water resources planning efforts, continuation of the preparation of river basin plans, and reviewing proposed interbasin transfers. In March, 1984, James S. Hoyte, Secretary of the Executive Office of Environmental Affairs and Chairman of the Water Resources Commission, designated the Division of Water Resources to provide the necessary staff support for the Water Resources Commission to administer these Acts.

Division's Main Long Range Goals

I. Collect, refine and update basic water resources data for dissemination to state, federal and local agencies and the general public.

II. Plan, implement and maintain works of improvement to prevent loss of life and damage to property from erosion, floodwater and sediment in the watersheds of the rivers and streams of the Commonwealth.

III. Facilitate the development of a statewide comprehensive water resources management plan for Massachusetts, formulated from river basin plans being developed from local, regional and state assessments of water needs and resources in conformance with the Massachusetts Water Policy Statement.

PERSONNEL OF THE DIVISION (as of June 30, 1985)

Kennedy, Charles F.	Director & Chief Engineer
Pyle, O. Fletcher	Associate Civil Engineer
Beshara, Michael L.	Associate Civil Engineer
Maguire, Kevin B.	Senior Civil Engineer
vacant	Senior Civil Engineer
Thibedeau, Richard H.	Chief Planner
Phippen, Peter D.	Principal Planner
Bones, William F., Jr.	Principal Planner
Asen, Steve	Resources Planner
Siegfriedt, Faye N.	Resources Planner
Graham, Deborah	Resources Planner
Shapiro, Sheldon	Supervising Environmentalist
Brown, David	Senior Marine Fisheries Biologist
McLaughlin, Joan	Senior Planner
Haberlin, Doris	Administrative Assistant
Tanzer, Philip	Senior Statistical Clerk
DiBattista, Cheryl	Senior Clerk Stenographer
Russo, Roseann	Junior Clerk Typist

FY85 Programs within the Division of Water Resources

I. BASIC DATA

A. Water Resources Data Interchange

One of the more important services of the Division of Water Resources is the dissemination of basic water resources data and other information to professionals, other resource planning agencies and the general public. The Division responds in a timely manner to the continous requests for information.

B. Basic Data Acquisition

1. Basic Data Gathering includes the recording of precipitation, stream gauging, snow surveys, reservoir elevations and flood monitoring. This information is necessary for detailed water supply and flood control planning. The Division operates a system of 199 rainfall stations. Statistical records are maintained on general weather conditions such as the rainfall records in the appendix of this report for calendar year 1984. This service is valuable to engineers, students, architects, climatologists and the legal profession. The Division also maintains logs of water wells drilled throughout the state pursuant to the requirements of M.G.L. Chapter 21, Section 16.

2. Water Use Data Program

Efforts this year focused on preparing data for input into the U.S. Geological Survey (USGS) data base State Water Use Data System (SWUDS) through a Division of Water Resources/USGS cooperative program to automate basic water resources data. The final report "Collection and Analysis of Public Water Supply Use Data for Massachusetts", which was prepared by Boston University and funded through a U.S.G.S. grant, completes an important phase of the program. In meeting the terms of the grant, several tasks were completed to transform the community water resources data, stored in file folders, into an automated information system. A cross-reference system was developed to match data from the State and U.S.G.S. In addition coding forms and a computer entry program were designed to enable the data to be entered quickly and easily. Of the 1005 active community water supply wells listed in DWR records, 880 have been accurately located and entered into the data base. Altogether, twenty-four data points of information for each water supply system have been automated. The system is designed to be of maximum utility to other water agencies and to DWR river basin planning.

C. Regional Resource Evaluations: The following are current studies or programs:

1. Water Resources and Priorities Study (cooperative with Soil Conservation Service)

Designed to expand information which supports the Early Acquisition of Reservoir Sites Program (Chapter 767, Acts of 1970), this study is evaluating and prioritizing the prime reservoir sites in the State's 27 river basins which were originally identified in the Massachusetts Water Resources Study completed in 1978. Using a screening process the sites were reduced to 50±. Field work was completed on these and work has been focused on the preparation of draft site reports. Seventeen (17) were completed during this fiscal year. Assistance was received from the Division of Water Supply (DEQE) to review the appropriateness of the sites used for water supply. The study is 85 percent complete. A Division of Water Resources staff member attended work group meetings, coordinated work tasks and provided water resources data.

2. "Atlas Program" - (Groundwater Studies)

This cooperative USGS/Division of Water Resources program inventories and assesses the quantity and quality of ground and surface water resources in river basins. The following work tasks were undertaken during the last year:

a) The Sudbury/Assabet/Concord river basin report was printed and distributed

b) Review of the Chicopee Atlas was completed at U.S. Geological Survey Headquarters in Reston, Virginia and shipped to Arizona for printing. It should be distributed during calendar year 1986.

c) The U.S.G.S. Headquarters review of the French - Quinebaug Atlas Report was completed.

d) The Blackstone River Basin Atlas was delivered to the printers and copies should be available in calendar year 1986.

3. Stream Gaging Program (cooperative with U.S. Geological Survey)

Streamflow data was collected for the 78 gaging stations operated in 1985. The 1984 water year surface-water data analysis was completed on these stations.

4. Chapter 800 Cooperative Groundwater Survey Program

This cooperative U.S. Geological Survey/Division of Water Resources program provides baseline data on major aquifers of each river basin in the Commonwealth. These comprehensive assessments identify areal extent, depth, hydrologic characteristics, the quality and quantity of water, and the effects of water use alternatives. Seven studies were in process during FY 1985 under the Chapter 800 program: the Charles River Basin Study was finished in May 1985. The Taunton River Basin Study will be completed in FY 86. The third year of the four year Plymouth/Carver Study was completed, and the second year of the Nashua River Basin and North River Basin Studies was finished. First year starts were made on Chapter 800 studies in the Blackstone and Neponset River Basins.

D. Early Acquisition of Reservoir Sites Program

The Division, pursuant to Chapter 21, Section 9A, M.G.L., is authorized by the State Legislature to acquire land, water or easements to protect future water resource values and conserve impoundment sites for the purpose of flood control, low flow augmentation and/or municipal water supply. Approximately 107 acres were acquired to enable the Abington and Rockland Joint Water Workds to expand the Hingham Street Reservoir. This water supply source serves Abington, Rockland and sections of Hanson, Pembroke, Norwell and Hingham. The Division is evaluating the costs associated with the acquisition of a site in Kingston for a new water supply reservoir for the City of Brockton. The Water Resources Commission is in the final stages of evaluating a reservoir site acquisition in Middleton to serve both Danvers and Middleton.

E. Metropolitan District Commission Long Range Water Supply Study

This comprehensive study was initiated by the Metropolitan District Commission to evaluate the alternative solutions to meeting the water supply needs of the Metropolitan Boston area. The study encompasses the water use, demand and supply alternatives for the 45 communities presently served by the MDC and for 12 possible future user communities. The demand management alternative has been adopted by the Metropolitan District Commission and the MDC has begun to implement the provisions of this alternative.

The Division of Water Resources participated in this study by:

1. Developing the basic water resources data on local safe yields used in this study.

2. Reviewing drafts of the material produced.

3. Attendance at several public meetings held during the course of the year.

II. FLOOD CONTROL

A. Watershed Protection and Flood Prevention Act (P.L. 566) Program. (a cooperative program with the U.S. Department of Agriculture)

1. Operational Watersheds

Vandalism is a continuing problem at many flood control impoundment sites. On the Cold Harbor Brook Site in Northboro in the SuAsCo Watershed Project all-terrain vehicles are causing damage and the neighbors have complained to their State Representatives. More maintenance funds are being spent in an attempt to limit access to the site.

The 1000 acre site in New Marlborough on the Blackberry River Watershed is a problem since hunters trespass on adjoining private property to gain access to State Forest lands via our flood control site. Acquiring additional property in the area to provide greater access to sportsmen is one possible solution.

a) Clam River - Berkshire County

All structures are complete except the Clam Lake site, where a solution to an erosion problem with a portion of the embankment is being pursued. Structural corrections have to be made to the riser which controls the water level of the lake.

b) Washington Mountain Brook - Berkshire County

The October Mountain Lake Project has been completed and accepted from the Contractor.

The Washington Mountain Lake investigation is underway. When the sample borings have been completed and the results evaluated a decision will be made as to how to correct the seepage problem.

Preliminary plans have been reviewed for the School House Lake Project.

c) Baiting Brook - Middlesex County

The Contract has been executed and construction has begun on the project.

d) Diamond Brook - Norfolk County

The channel improvement project is completed.

2. Flood Plain Management Studies

These joint DWR/U.S. Soil Conservation Service (SCS) studies authorized by Section 6 of Public Law 83-566 provide needed information to communities where flood damages are a serious concern and local government wants to take action to reduce these damages. Thus, these studies are site specific and of a problem solving nature.

The Division of Water Resources is the coordinating agency for the SCS Flood Plain Management Program. It receives FPMS applications from the communities, provides data used in conducting the studies and coordinates agency review of draft reports. Program accomplishments during Fiscal Year 1985 were as follows:

a) A study was completed for Cobb Brook Watershed in the City of Taunton that outlined alternatives designed to prevent flooding in an industrial park area south of Route #138. Based on this report, the City has embarked on a program to replace inadequate culverts with new ones that will pass the 100-year flood flow without overtopping roadways.

b) A draft F.P.M.S. report was prepared for Salisbury Brook in the City of Brockton. It is being reviewed by the City. Suggestions will be incorporated into a floodplain management plan (draft) to guide local actions which will emphasize non-structural flood control measures including management practices for existing reservoirs.

c) A flood plain management study (FPMS) was requested by the Towns of Southwick, Mass. and Suffield, Conn. through their joint organization; the "Congamond Lakes Restoration Committee." A plan of work (POW) was developed for a study that provides information about the frequent flooding of lakeshore homes coupled with the need for better water level management. To get started, SCS has made field surveys to analyse flooding problems. Hydraulic and hydrologic studies are in progress that apply computer models to set out management alternatives that reduce flood damages. SCS coordinates with other agencies such as the Division of Waterways (DEM) who is currently completing a channel improvement project on the Great Brook outlet of Middle Congamond Lake to facilitate flow from the lake and provide storage capacity during storm events.

B. Federal Emergency Management Agency Program

1. National Flood Insurance Program

Of the participating communities in the Commonwealth, 287 are in the Regular Program and 38 in the Emergency Program. Three (3) communities are suspended from the program for their failure to adopt required land use measures.

2. Flood Hazard Management Project (FHMP)

The Flood Hazard Management Project (FHMP) was established within the Division of Water Resources in 1981. The FHMP, funded by the Federal Emergency Management Agency (FEMA) through the State Assistance Program (SAP), continued to promote flood hazard mitigation practices within the Commonwealth during FY 84.

Funding cuts, coinciding with Federal FY 85, reduced FHMP staff to two SAP federal positions and one state position provided as the state's share of the funding. Funding cuts have occurred every year since 1981 as part of a FEMA policy designed to encourage individual states to assume the costs of the program, thereby taking over the responsibility of their own flood hazard mitigation problems. Federal funding for only one position will be continued in FY 86. A 25% State match is required.

The following accomplishments were made during this fiscal year:

a) Forty Community Assistance and Program Evaluation meetings were held throughout the State to assist communities in implementing the requirements of the NFIP, Massachusetts Building Code and wetlands protection laws.

b) The Statewide Clearinghouse for Flood Hazard Information received over 840 requests for information and distributed 3000 pieces of literature.

c) The Acquisition Program continued in coastal communities and expanded to include inland communities. Assistance was offered to communities that wished to apply for public money for purchasing floodprone areas for the purpose of conservation and recreation. A total of eleven towns have benefitted from this service.

d) Floodplain management workshops were held for the benefit of local public health officers on Cape Cod and for the general public in Leicester. A local assistance workshop was held for town officials in Wellfleet.

e) Technical assistance in floodplain management was provided to seven communities in western Massachusetts that were scheduled for early conversion to the regular phase of the National Flood Insurance Program.

III. WATER RESOURCES PLANNING

A. River Basin Planning Program

The Water Resources Management Planning Regulations 313 CMR 2.00 were adopted by the Massachusetts Water Resources Commission in 1979 to establish a framework for the developement of plans for the river basins of Massachusetts and a state-wide water resource management plan. The basic purpose of these regulations is to facilitate the development of comprehensive water resources management plans for Massachusetts. These plans are being based on local, regional and state assessments of water needs and resources to be in conformance with the Massachusetts Water Supply Policy Statement and to be developed from adequate data aggregated by river basins.

The development of a river basin plan involves five steps: 1) inventory the basin's water resources, demand and uses, 2) analyze data and identify projected water needs, 3) develop alternatives, 4) prepare water resources management plan, and 5) adopt the plan.

The inventory stage is being carried out in a layer approach with each inventory component being collected simultaneously for all the river basins in the State. This allows statewide assessments to be prepared as each inventory component is developed and baseline data base to be established ensuring consistency of information among a wide variety of programs and projects at the local, regional and state level.

Planning efforts during this fiscal year focused on making significant progress in stage 1 the inventory of 27 river basin's water resources, demand and uses and initiating work on stage 2 of the planning process.

Accomplishments during the reporting period included:

1. Community Water Resources Data

   The Division continued its ongoing responsibility of updating and analyzing the community water resources data. This detailed information is being used as the foundation for developing the 27 river basin plans, to help target many of the State's water resources local grant programs and to prepare long range water demand projections.

2. Disaggregate Data by River Basins

   The basic water resource data was assembled by basin and the following reports were produced:

   a) "Blackstone River Basin - Inventory and Analysis of Current and Projected Water Use"

   b) "Directory of State, Federal and Regional Water Planning And Management Agencies"

   c) "Massachusetts Public Water Supply Systems Annual Average Day Demand 1980-1984"

3. River Basin Map

   A page size, 11" x 17" and a wall display size map of the river basins of the Commonwealth as approved by the Water Resources Commission were drafted and printed.

4. Ipswich River Basin

   Work continued on reactivating and updating the hydrologic simulation computer model for the Ipswich River. This effort included field visits to the local water supply agencies to refine data on water supply sources, initial preparation of an inventory and analysis of current and projected water use in the Ipswich Study Area and updating the water resources data in the computer model.

5. Charles River Basin

Field research was completed to collect community water resources data to prepare an inventory and analysis of current and projected water use in the Charles River Basin.

B. State Land Management Planning

To assist in the development of the Guidelines for Operation and Land Stewardship (G.O.A.L.S.) plans for the State's Forests and Parks, the public water supply sources located in the same sub-watershed and in close proximity to one of the Department's land holdings were identified and located in topographic maps. This analysis indicated that 95 or approximately 10% of the public water sources in the state fell in this category.

C. Merrimack River Needs and Management Study

The Division administered a legislative grant to the Merrimack River Watershed Council to conduct a study of the demands and needs for the waters of the Merrimack River.

D. Interbasin Transfer Act

As part of its new responsibility of providing staff support to the Water Resources Commission, considerable time and effort was devoted by Division staff to assisting the Commission develop regulations to implement the Interbasin Transfer Act. Division assistance in the regulations development process included background research, drafting sections of the regulations, preparing summaries and explanatory material, presentations at the hearings and preparing a summary of the hearing comments. The regulations define and delineate the river basins of the Commonwealth and establish application procedures and criteria upon which the Water Resources Commission shall base its approval or disapproval of any proposed interbasin transfer of water. They were adopted by the Commission in April, 1985.

E. Water Resources Planning Task Force

The Water Resources Commission established a Water Resources Planning Task Force to assist the Commission to coordinate water resources planning among the agencies and departments in the Executive Office of Environmental Affairs. The task force is the primary mechanism to implement Chapter 21A, Section 8B (b) which establishes the planning coordinating function of the Commission as reorganized by the Acts of 1983. The task force also served as an advisory committee to the Commission this year to assist it in developing regulations and criteria to implement the new Interbasin Transfer Act. The task force is chaired by the Division's Chief Planner.

The task force consists of as core members, a representative of the principal state water planning and management agencies, and as contributing agencies and associations, representatives of other organizations involved in water resources planning issues in Massachusetts.

F. Water Supply Task Force

In 1983, the Water Resources Commission established an in-house Task Force to review and update the Massachusetts Water Supply Policy Statement. The Task Force considered current state agency operational water supply procedures, new information on water supply issues, and practical experiences of local and state governments.

A draft update was developed by the Task Force and approved in concept, by the Water Resources Commission in January, 1984. Agency and public review of the draft occurred during the spring with final adoption by the Commission in August, 1984 of "The Updated Massachusetts Water Supply Policy Statement".

At that time the Commission requested that this Task Force continue its efforts by drafting policies for private water supplies. The Task Force, comprised of representatives from the five departments within the Executive Office of Environmental Affairs, the Department of Public Health, and the Department of Public Works met monthly through the year and developed a draft which was approved for public review in June, 1985.

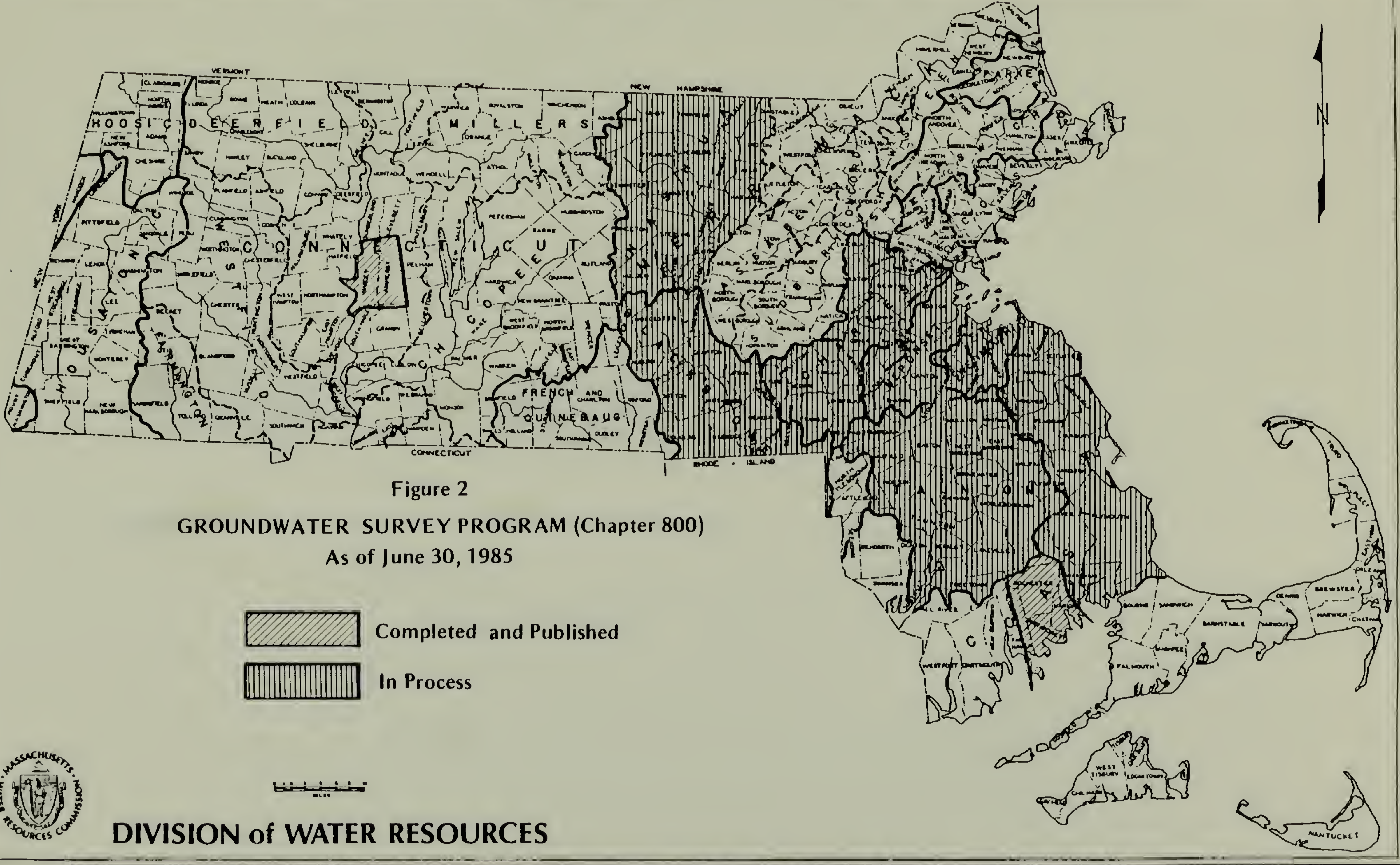

Figure 2

GROUNDWATER SURVEY PROGRAM (Chapter 800)
As of June 30, 1985

▨ Completed and Published

▥ In Process

DIVISION of WATER RESOURCES

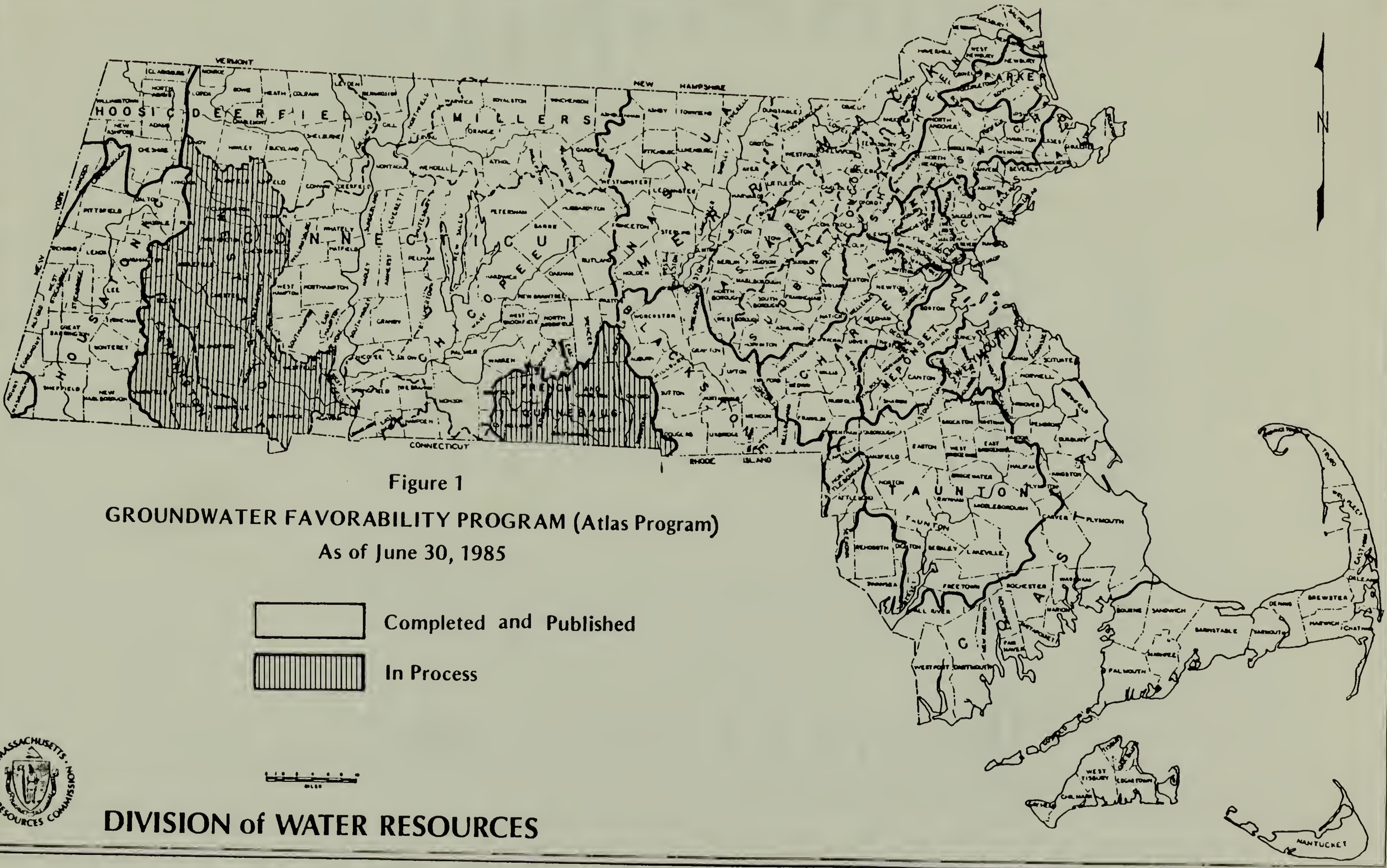

Figure 1

GROUNDWATER FAVORABILITY PROGRAM (Atlas Program)

As of June 30, 1985

☐ Completed and Published

▥ In Process

DIVISION of WATER RESOURCES

MASSACHUSETTS PRECIPITATION 1984
(inches)

	State	Northeast Section	Southeast Section	Central Section	Conn. River Section	Western Section
January	2.55	2.52	2.60	2.57	2.06	2.26
February	6.70	7.52	5.36	6.20	6.52	5.79
March	5.53	6.49	6.10	5.68	4.88	4.67
April	4.77	4.07	4.52	4.39	4.80	5.14
May	9.34	8.42	4.53	8.79	12.95	12.95
June	4.38	3.84	5.94	2.64	2.78	2.56
July	5.24	4.76	5.21	4.92	5.49	4.98
August	1.41	1.00	0.69	1.23	1.62	2.47
September	1.47	1.09	1.94	1.56	1.49	1.96
October	3.48	3.65	4.13	3.96	3.12	2.47
November	3.07	2.60	1.64	3.01	3.71	3.37
December	3.15	3.18	3.35	3.03	3.08	2.64
Year	51.09	49.14	46.01	47.98	52.50	51.26
Normal	44.46	42.66	44.83	44.73	44.97	45.08

MASSACHUSETTS PRECIPITATION 1984
DEVIATION FROM NORMAL
(inches)

	State	Northeast Section	Southeast Section	Central Section	Conn. River Section	Western Section
January	-1.14	-1.16	-1.39	-1.26	-1.37	-0.99
February	+3.31	+4.13	+1.72	+2.70	+3.34	+2.85
March	+1.65	+2.69	+1.90	+1.61	+1.23	+1.28
April	+1.07	+0.45	+0.50	+0.62	+1.12	+1.36
May	+5.64	+5.11	+1.13	+5.30	+8.95	+9.01
June	+0.79	+0.46	+2.62	-1.07	-1.21	-1.64
July	+1.56	+1.31	+2.26	+1.41	+1.37	+0.64
August	-2.51	-2.62	-3.37	-2.45	-2.43	-1.81
September	-2.11	-2.42	-1.71	-2.19	-2.26	-2.16
October	-0.07	+0.35	+0.53	+0.56	-0.38	-0.95
November	-0.88	-1.32	-2.22	-1.07	-0.23	-0.44
December	-0.68	-0.50	-0.79	-0.91	-0.60	-0.97
Total Excess or Deficiency for Year 1984	+6.63	+6.48	+1.18	+3.25	+7.53	+6.18